PCT

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International Bureau

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A3

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9912046.1	24 May 1999 (24.05.99)	GB

(71) Applicant *(for all designated States except US)*: BRITISH AIRWAYS PLC [GB/GB]; Waterside, P.O. Box 365, Harmondsworth, West Drayton UB7 0GB (GB).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: ROUND, Matthew [GB/GB]; 25 Avondale Road, Mortlake, London SW14 8PU (GB). DARBYSHIRE, Martin [GB/GB]; 6 Digby Crescent, Finsbury Park, London N4 2HR (GB).

(74) Agents: WHITTEN, George, A. et al.; R.G.C. Jenkins & Co., 26 Caxton Street, London SW1H 0RJ (GB).

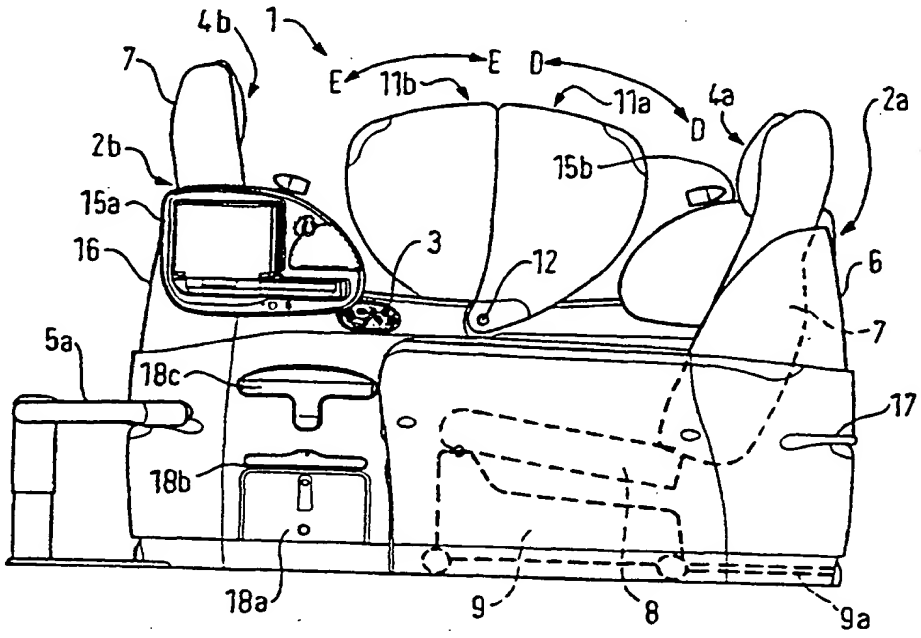
(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published

With international search report.

(88) Date of publication of the international search report: 3 August 2000 (03.08.00)

(54) Title: A SEATING UNIT



(57) Abstract

A seating unit for a vehicle comprises a pair of seats (6, 7) facing in opposite directions with each seat comprising a seating space for receiving the seated body of an occupant and an extension space in which the legs of an occupant may be placed. The seats are positioned each side of a notional dividing axis with the seating space of one extending over the axis at the extension space of the other. The pair of seats is suitable for use in an aircraft cabin with one of the seats facing substantially forward in the cabin and the other of the seats facing substantially aft.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

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EE	Estonia						

INTERNATIONAL SEARCH REPORT

Inte[redacted]al Application No
PC[redacted]GB 99/03445

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B64D11/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 B64D B61D B60N B62D A47C B60R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 036 822 A (LEGRAND PIERRE) 30 September 1981 (1981-09-30) page 1, line 2 page 1, line 7 - line 12	1,2,9
Y	page 2, line 27 - line 43	10

Y	WO 98 36967 A (HAITH PHILIP ;PARK JAMES WILLIAM (GB); SINGAPORE AIRLINES LTD (SG)) 27 August 1998 (1998-08-27)	10
A	figures 15A,15B	6-9,33
X	page 17, line 22 -page 18, line 6; figures 12A,12B	32

A	DE 41 25 958 C (DEUTSCHE AIRBUS GMBH) 1 October 1992 (1992-10-01) column 2, line 60 - line 62	2

	-/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
8 May 2000	11 05. 2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Hauglustaine, H

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Int[redacted]al Application No
PCT/GB 99/03445

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 1 702 827 A (LUCILLE LESLIE GUSTAVESON) 19 February 1929 (1929-02-19) page 1, line 1 - line 10 page 1, line 25 - line 36	1
X	WO 92 06003 A (H.W. STRUCTURES LIMITED) 12 April 1992 (1992-04-12) page 5, line 7 -page 6, line 16	11,12,14
X	page 13, line 4 - line 16	15
A	US 2 629 425 A (V.L.R. JAMES) 24 February 1953 (1953-02-24) column 5, line 3 - line 15	13
X	FR 2 116 446 A (UNITED KINGDOM OF GREAT BRITAIN AND NORTHRERN IRELAND) 13 July 1972 (1972-07-13) the whole document	11
X	DE 36 17 709 A (BOETZEL KLAUS) 3 December 1987 (1987-12-03) column 2, line 44 - line 52; claim 6	16
A	column 4, line 51 - line 54; figure 9	17,21
A	US 3 074 759 A (H.O. BERGENWALL) 22 January 1963 (1963-01-22) column 1, line 33 - line 46	21,22
A	DE 37 29 836 A (GEBR. HAPPICH BMBH) 23 March 1989 (1989-03-23) the whole document	23
A	FR 2 579 434 A (COMPAGNIE NATIONALE AIR FRANCE) 3 October 1986 (1986-10-03) page 10, line 7 -page 12, line 26	25,26
X	EP 0 545 691 A (MATSUSHITA AVIONICS SYSTEMS) 9 June 1993 (1993-06-09) column 5, line 33 -column 6, line 38	29
X	WO 97 39946 A (SONY CORPORATION) 30 October 1997 (1997-10-30) page 4, line 1 - line 14	32
A	DE 197 05 754 A (SCHALTBAU AG) 20 August 1998 (1998-08-20) column 3, line 61 -column 4, line 20	30-32
X	GB 2 295 962 A (BRITISH AIRWAYS PIC) 19 June 1996 (1996-06-19) page 21, line 21 -page 22, line 2; figure 19	29

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
J41093WO		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/GB 99/03445	15/10/1999	15/10/1998
Applicant		
BRITISH AIRWAYS PLC et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 05 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

   a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   [ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

   b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

   [ ] contained in the international application in written form.

   [ ] filed together with the international application in computer readable form.

   [ ] furnished subsequently to this Authority in written form.

   [ ] furnished subsequently to this Authority in computer readble form.

   [ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   [ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [X] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

   [X] the text is approved as submitted by the applicant.

   [ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

   [ ] the text is approved as submitted by the applicant.

   [X] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

   [X] as suggested by the applicant.

   [ ] because the applicant failed to suggest a figure.

   [ ] because this figure better characterizes the invention.

   [ ] None of the figures.

INTERNATIONAL SEARCH REPORT

[redacted]al application No.
PCT/GB 99/03445

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

CLAIMS 1-10,33
CLAIMS 11-15
CLAIMS 16-22
CLAIMS 23-28
CLAIMS 29-32

1. ☒ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☒ No protest accompanied the payment of additional search fees.

B x III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

Line 1, after "seats" insert "(6,7)"

INTERNATIONAL SEARCH REPORT

Information on patent family members

Int[redacted]al Application No
PCT/GB 99/03445

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0036822	A	30-09-1981	FR	2478555 A	25-09-1981
			FR	2496570 A	25-06-1982
			ES	500657 D	16-08-1982
			ES	8206298 A	16-11-1982
			JP	56156111 A	02-12-1981
WO 9836967	A	27-08-1998	SG	54502 A	16-11-1998
			AU	5539598 A	27-08-1998
			AU	6432198 A	09-09-1998
			CN	1197623 A	04-11-1998
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			EP	0980825 A	23-02-2000
			EP	0980826 A	23-02-2000
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FR 2116446	A	13-07-1972	AU	3636471 A	07-06-1973
			DE	2159240 A	03-08-1972
			GB	1346060 A	06-02-1974
			IT	943133 B	02-04-1973
DE 3617709	A	03-12-1987	NONE		
US 3074759	A	22-01-1963	NONE		
DE 3729836	A	23-03-1989	NONE		
FR 2579434	A	03-10-1986	NONE		
EP 545691	A	09-06-1993	US	5177616 A	05-01-1993
			JP	6296254 A	21-10-1994
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			AU	2610297 A	12-11-1997
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GB 2295962	A	19-06-1996	AU	3575499 A	19-08-1999
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			AU	709431 B	26-08-1999
			AU	3910295 A	20-06-1996
			AU	4182396 A	03-07-1996
			BR	9510008 A	21-10-1997
			CA	2165097 A	14-06-1996
			CN	1132711 A	09-10-1996
			DE	19544754 A	20-06-1996
			EP	0794897 A	17-09-1997
			FI	972497 A	12-08-1997

INTERNATIONAL SEARCH REPORT

Information on patent family members

In[illegible] Application No
PCT/GB 99/03445

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB 2295962 A		FR 2727932 A	14-06-1996
		FR 2769286 A	09-04-1999
		WO 9618537 A	20-06-1996
		GB 2326824 A,B	06-01-1999
		GB 2331237 A,B	19-05-1999
		IT RM950813 A	13-06-1996
		JP 8258796 A	08-10-1996
		NL 1001893 C	13-06-1996
		NZ 297049 A	29-04-1999
		NZ 334165 A	29-06-1999
		NZ 334166 A	29-06-1999
		SG 33627 A	18-10-1996
		ZA 9510537 A	19-06-1996

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

WHITTEN, George Alan
R.G.C. JENKINS & CO.
26 Caxton Street
LONDON SW1H ORJ
GRANDE BRETAGNE

R. G. C. JENKINS & CO.
★ 06 FEB 2001 ★
CHARTERED PATENT AGENTS

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	02.02.2001
Applicant's or agent's file reference J41093WO	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB99/03445	15/10/1999	15/10/1998

Applicant
BRITISH AIRWAYS PLC et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Stafl, C Tel.+49 89 2399-2698

Form PCT/IPEA/416 (July 1992)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
J41093WO		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/GB99/03445	15/10/1999	15/10/1998
International Patent Classification (IPC) or national classification and IPC B64D11/06		
Applicant BRITISH AIRWAYS PLC et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☒ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
12/05/2000	02.02.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Pedersen, K Telephone No. +49 89 2399 2874

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB99/03445

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

1-16	as originally filed	

Claims, No.:

13-33	as originally filed	
1-12	with telefax of	10/01/2001

Drawings, sheets:

1/12-12/12	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

IV. Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

   ☒ restricted the claims.

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☐ neither restricted nor paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is

   ☐ complied with.

   ☒ not complied with for the following reasons:
   see separate sheet

4. Consequently, the following parts of the international application were the subject of international preliminary examination in establishing this report:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-10, 33.

V. Reasoned statement under Article 35(2) with r gard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims 1-9, 33
	No:	Claims 10

Inventive step (IS)	Yes:	Claims	1-9, 33
	No:	Claims	10
Industrial applicability (IA)	Yes:	Claims	1-10, 33
	No:	Claims	

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

Point IV, 3

1. The International Preliminary Examination Authority agrees with the reasoning for lack of unity of invention set out in the Invitation to Pay Additional Search Fees of 22.02.2000, the present application thus containing the following five non-unitary groups of inventions

    1. Claims 1-10, 33 (seat unit having a pair of seats)
    2. Claims 11-15 (reclining seat device to compensate take-off angle)
    3. Claims 16-22 (secondary unit)
    4. Claims 23-28 (seating unit for an aircraft cabin comprising a foot rest)
    5. Claims 29-32 (an in-flight entertainment unit)

    where in view of EP-A-0 036 822 no special technical features in the sense of Rule 13.2 PCT exist. The Applicant has requested examination to be carried out on Group 1 only.

Point V, 2

1. Claim 1:

1.1 The document EP-A-0 036 822 (henceforth known as D1) is regarded as being the closest prior art to the subject-matter of claim 1 and shows a seating unit according to its preamble (see in particular Figure 1 and page 2, lines 27-41), i.e.:

A seating unit (2) for a vehicle, the seating unit comprising a pair of seats facing in opposite directions (cf. the position of headrests 9, 10 and the relative location of seat portions 7, 8, 11 and 12) with each seat comprising a seating space (5, 6) for receiving the seated body of an occupant and an extension space (11, 12) in which the legs of an occupant may be placed (page 2, line 33), the seats being positioned each side of a longitudinal axis (18; cf. also page 2, lines 36-37) with the seating space of one extending over the axis at the extension space of the other (by virtue of the angled partition wall 17, one seat extending into the extension space of the other where the reference sign "-6-" is to be found in Figure 1; cf. also here page 2, lines 36-37).

The subject-matter of claim 1 therefore differs from this known seating unit in that either of said seats has a seat axis substantially parallel to said longitudinal axis.

The subject-matter of claim 1 is therefore new (Article 33(1) and (2) PCT).

1.2 These characterizing features enable the seating unit to be arranged in the vehicle in a position which is ergonomically favourable to the seat occupants (they would face fore respectively aft) while maintaining compact dimensions.

These characterizing features are already from another seating unit with a pair of seats facing in opposite direction disclosed in US-A-1 702 827 (D2; see Figure 1). However, for the following reasons it is not considered obvious to add these features of D2 to the seating unit of D1 in order to obtain the above-mentioned advantages and thereby obtaining a seating unit according to claim 1:

(a) The seating unit of D2 is not intended for vehicles and consequently does not mention the above-mentioned ergonomically advantages pertaining only to the use in a vehicle. It would also not be suitable for use in a vehicle, in particular since no considerations are given to the total amount of space taken up by this unit; there being no extension of seating space of one seat extending over the longitudinal axis in to the extensions (legs, feet) space of the other.

(b) The angled alignment with respect to the longitudinal axis of the individual seat axes (see the pointed lines in Figure 1) is an integral feature of the seating unit of D1 in order not to impose on the width of the corridor (34; Figure 3) and this is regarded as presenting the skilled person with an obstacle to modification of the unit of D1 in this respect.

The subject-matter of claim 1 therefore involves an inventive step (Article 33(1) and (3) PCT).

2. Claims dependent on claim 1:

Claims 2-9 and 33 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

3. Claim 10:

3.1 The document D1 shows (see in particular Figure 1 and page 2, lines 27-41)

A pair of seats (2), one for facing forward and the other for facing aft when fitted in an aircraft (cf. the position of headrests 9, 10 and the relative location of seat portions 7, 8, 11 and 12; the seats could be installed in this manner in an aircraft and "facing forward/aft" does not necessarily mean that the seat axes are exactly parallel with the longitudinal axis of the aircraft), each seat defining a major occupancy area (5, 6) and a minor occupancy area (11, 12) extending away from the major occupancy area along a seat axis (pointed lines), the seats being positioned adjacent to each other such that the walls of the seats (17) share a common axis offset with respect to the seat axes (Figure 1, 2) to define a major occupancy area (5 respectively 6) in one of the seat[s] which is larger than the minor occupancy area (11 respectively 12) in the other of the seats.

The subject-matter of claim 10 is therefore not new (Article 33(1) and (2) PCT).

4. Industrial applicability is evident for claims 1-10 and 33 (Article 33(1) and (4) PCT).

Point VII

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the document D1 is not mentioned in the description, nor is this document identified therein.

2. The features of the claim 10 are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Point VIII

1. Claim 2 comprises exclusively features relating the intended use of the seating unit of claim 1. With the latter defining only the seating unit as such, further details of its specific location in the aircraft cannot be regarded as additional features in the sense of Rule 6.4(a) PCT. Moreover, it becomes unclear (Article 6 PCT) whether claim 2 relates to the seating unit as such, or to the combination of a seating unit and a vehicle.

2. In claim 7 the exact meaning of an "extension unit" is not clear, since it is not apparent from this claim what is in fact extended by this unit.

3. A statement of purpose, the sole content of claim 9, is not an additional technical feature in the sense of Rule 6.4(a) PCT, thus rendering claim 9 unclear. Such a statement belongs in the opening line of the independent claim 1, as an option if required.

4. The description is not consistent in scope with the amended claims.

CLAIMS:

1. A seating unit for a vehicle the seating unit comprising a pair of seats facing in opposite directions with each seat comprising a seating space for receiving the seated body of an occupant and an extension space in which the legs of an occupant may be placed, the seats being positioned each side of a notional dividing axis with the seating space of one extending over the axis at the extension space of the other.

2. A seating unit according to claim 1, wherein the pair of seats is arranged so that one of the seats will face substantially forward when fitted in a vehicle and the other of the seats will face substantially aft.

3. A seating unit according to claim 1, wherein each of the seats comprises an arm rest, with the arm rest of one of the seats arranged along a common axis with the arm rest of the other seat.

4. A seating unit according to claim 3, wherein the common axis is substantially coincident with the notional dividing axis between the seats.

5. A seating unit according to any of claims 1 to 4, wherein the pair of seats are contained within a housing or each seat is contained within a respective housing, the housing or housings bounding the seating spaces and the extension spaces, and forming a wall between the seats, which wall is offset with respect to the notional dividing axis of the seats.

6. A seating unit according to any preceding claim, in which each of the seats comprises a back portion and a seat portion and wherein the seating portion of each seat is movable to allow the back portion of each seat to be reclined.

7. A seating unit according to claim 6, further comprising an extension unit in each of the extension spaces positioned to face the respective seat.

8. A seating unit according to claim 7, wherein the seating portion of each seat is movable to a fully extended position to allow the back portion to recline to a fully reclined position so that together the extension unit, the seat portion and the back portion form a flat surface.

9. A seating unit according to any preceding claim, wherein the seating unit is for an aircraft.

10. A pair of seats, one for facing forward and the other for facing aft when fitted in an aircraft, each seat defining a major occupancy area and a minor occupancy area extending away from the major occupancy area along a seat axis and comprising a wall to one side of the major occupancy area, the seats being positioned adjacent to each other such that the walls of the seats share a common axis offset with respect to the seat axes to define a major occupancy area in one of the seat which is larger than the minor occupancy area in the other of the seats.

11. A seat for use in an aircraft cabin, the seat comprising a back pan and a seat pan operable together to a plurality of different positions including a take-off position at which the seat pan is inclined to the floor of the cabin to compensate for the take off angle of the aircraft.

12. A seat according to claim 11, wherein the seat is for facing aft when fitted in an aircraft cabin.

A SEATING UNIT

This invention relates to a seating unit. More specifically the invention relates to an aircraft seating unit.

In our International patent application (Publication No. WO 96/18537) there is described a seating unit which comprises a primary seat and a secondary unit. The seating unit can be easily manipulated from a "seating configuration" wherein the primary seat functions as a seat to a "bed configuration" wherein the primary seat co-operates with the secondary unit to form a flat sleeping surface. For increased passenger privacy each seating unit is contained within its own fixed housing.

The seats described in WO 96/18537 are currently being used in our first class cabins. The ease of manipulation of each seating unit from a "seat configuration" to a "bed configuration" within a fixed housing, and also the staggered arrangement of the units helps provide a level of comfort and privacy which has set an industry benchmark. In most aircraft the business class cabin is fitted with large reasonably spaced apart seats. However, such seats are not designed to lie flat and do not provide passengers with as much privacy as they would ideally prefer. Despite their success in first class cabins the seating units described in WO 96/18537 are not well suited for use in business class cabins. This is because fitting such seats in a business cabin would mean having to reduce the overall seating capacity of the cabin to an uneconomical level.

It is therefore desirable to provide a seating unit suitable for use in an aircraft cabin, the unit being private and comfortable and making efficient use of the space available in the cabin.

According to the invention there is provided a seating unit for a vehicle the seating unit comprising a pair of seats facing in opposite directions with each seat comprising a seating space for receiving the seated body of an occupant and an extension space in which the legs of an occupant may be

placed, the seats being positioned each side of a notional dividing axis with the seating space of one extending over the axis at the extension space of the other.

According to another aspect of the invention there is provided a pair of seats, one for facing forward and the other for facing aft when fitted in an aircraft, each seat defining a major occupancy area and a minor occupancy area extending away from the major occupancy area along a seat axis and comprising a wall to one side of the major occupancy area, the seats being positioned adjacent to each other such that the walls of the seats share a common axis offset with respect to the seat axes to define a major occupancy area in one of the seat which is larger than the minor occupancy area in the other of the seats.

According to another aspect of the invention there is provided a seat for use in an aircraft cabin, the seat comprising a back pan and a seat pan operable together to a plurality of different positions including a take-off position at which the seat pan is inclined to the floor of the cabin to compensate for the take off angle of the aircraft.

According to another aspect of the invention there is provided a secondary unit for use in an aircraft cabin with an aircraft seat, the unit comprising: a pad mounted on an elongate support, the support being of variable height, whereby the elevation of the pad above the cabin floor can be altered.

According to another aspect of the invention there is provided a seating unit for an aircraft cabin, the unit comprising; a seat movable between a retracted position and an extended position; a footrest that is movable into and out of alignment with the seat; and a footrest actuator arranged to move the footrest into alignment with the seat, when the seat is moved towards the extended position.

According to another aspect of the invention there is provided an in-flight entertainment unit comprising: a housing; a monitor supported on the housing by a support arm, the support arm being rotatable about the housing to move the monitor between a stored position and a viewing position and the monitor being rotatable about the support arm to vary a viewing angle when in the viewing position.

According to another aspect of the invention there is provided an in-flight entertainment unit comprising in a self-contained unit which facilitates maintenance of the unit two or more of the following, namely: a monitor; a computer power point; a cocktail table; a condition indicator; or an audio output jack.

The above and further features of the invention are set forth with particularity in the appended claims and together with advantages thereof will become clearer from consideration of the following detailed description of an exemplary embodiment of the invention given with reference to the accompanying drawings.

In the drawings:

Figure 1 shows a side view of a pair of seats embodying the invention;

Figure 2 shows a side view of a pair of seats embodying the invention;

Figure 3 shows a plan view of a pair of seats embodying the invention;

Figure 4 shows a plan view of a pair of housings for the seats shown in Figures 1 to 3;

Figures 5a to 5c show an in-flight entertainment unit;

Figures 6a to 6e show a side view pair of a pair of multimode seats;

Figure 7a shows a perspective view of a secondary unit;

Figure 7b shows a secondary unit in an upright configuration;

Figure 7c shows a secondary unit having a pad in a lowered configuration;

Figure 7d shows a secondary unit having a pad in a stored configuration;

Figure 7e shows a plan view of a secondary unit;

Figure 8 shows a plan view of a pair of seats embodying the invention;

Figure 9 shows a plan view of a seating portion approaching a misaligned secondary unit;

Figure 10 shows a side view in partial cut-away of a secondary unit;

Figure 11 shows an arrangement of seats in an aircraft cabin;

Referring now to Figures 1 to 3 of the accompanying drawings there is shown a pair of seating units 1 for an aircraft. The pair of seats 1 is mounted on a pallet to facilitate fitting of the pair in an aircraft cabin. Such pallets are known in the art and therefore need not be described further herein. The pair of seating units 1 are in side-by-side arrangement, with a first seating unit 2a for facing towards the front of the aircraft cabin and a second seating unit 2b facing towards the rear of the aircraft cabin. Each of the first and second seating units 2a and 2b comprises a primary reclinable seat 4a, 4b which faces a secondary unit 5a, 5b. During a flight, a passenger can recline in comfort on a primary seat 4 whilst resting his or her feet on the corresponding secondary unit 5.

The primary seat 4a is contained in a first housing 6, within which the primary seat 4a can recline. The primary seat 4b is contained within a second housing 16 within which it can recline. The first housing 6 and the second housing 16 provide privacy between the two primary seats 4a and 4b.

In many respects the two seating units are substantially identical. In order to simplify the following description, reference will be made to the features and operation of a single seating unit except where there are differences between the two.

Each primary seat 4 comprises a back portion 7 pivotally connected to a seating portion 8. The seating portion 8 is supported on the cabin floor by a trolley 9 which is drivable, under the control of a respective control pad 3, by a motor operated screw shaft 9a. Driving of the trolley 9 serves to move the primary seat 4 between an upright position, as shown in Figure 1, to a bed position, as shown in Figure 2. In the bed position, the secondary unit 5 together with the seat portion 8 and back portion 7 of the primary seat 4 form a sleeping surface. Also, in this bed position the back portion 7 is supported by a support 17 in the housing. The movement of the seating portion 8 and the back portion 7 between the upright and bed positions is guided by suitable guide tracks (not shown) contained in the housing 6 or 16 at each side of the primary seat 4. Such guide tracks are well known in the art and are described in greater detail in the aforementioned international patent publication WO 96/18537.

The first housing 6 and the second housing 16 are most clearly shown in plan view in Figure 4. For improved clarity the primary seats 4 and secondary units 5 are not shown in Figure 4. The first housing 6 comprises a first side wall 6a, a second side wall 6b, and a curved back wall 6c which together define a space within which the seating unit 2a (not shown) is contained.

The first side wall 6a, the second side wall 6b and the back wall 6c are preferably separate structures and are assembled together by clipping the back wall 6c to each of the first 6a and second 6b side walls. The second housing 16 is similar in design to the first housing 6 and comprises its own first side wall 16a, second side wall 16b and curved back wall 16c respectively.

In the side-by-side arrangement in which the seating units are placed the first side wall 6a and the first side wall 16a are adjacent to each other. Thus, the first housing 6 and the second housing 16 together form in plan view a distorted S shape. Arm rests 10a and 10b are provided on the first side

walls 6a, 16a and second side walls 6b, 16b. This arrangement simplifies the maintenance of components of the seating unit, because access to the components which would otherwise be difficult, can be gained by unclipping and removing a back wall from its housing.

The first side wall 6a of the first housing 6 and the first side wall 16a of the second housing 16 both extend along an axis A-A which axis is offset with respect to the longitudinal axis B-B of the pair of seating units. The second side walls 6b and 16b of the housings 6 and 16 extend along an axis which is substantially parallel to the longitudinal axis of the pair of seating units. The space defined by the housings, 6, 16 are therefore less at the secondary units 5 than at the back walls 6c and 16c. The first housing 6 can therefore be thought of as defining a major occupancy area Xa for the upper part of one occupant and a minor occupancy area Ya for the lower part of the one occupant. Similarly the second housing 16 can be thought of as defining a major occupancy area Xb for the upper part of another occupant and a minor occupancy area Yb for the lower part of the other occupant.

In this configuration, the seating units can be thought of as being positioned each side of a notional dividing line corresponding to the longitudinal axis B-B of the pair of seating units. The housings 6 and 16 are shaped so that the major occupancy area Xa of the first seating unit 2a extends over the dividing line B-B at the minor occupancy area Yb of the second seating unit 2b and so that the major occupancy area Xb of the second seating unit 2b extends over the dividing line B-B at the minor occupancy area Ya of the first seating unit 2a. Thus, extra space is provided where it is needed for the upper body of a passenger and less space, where it is not needed, for the legs. Enough space is made available for each of the seating units to be provided with the arm rests 10a, 10b with the arm rests 10a arranged along a common axis.

Conveniently, each seating unit is also provided with storage space located underneath the primary seat of the adjacent seating unit and accessible via a hatch 18a (see Figure 1). The storage space may be used to store personal belongings of a passenger, or safety equipment such as a lifejacket. Additional storage space may be provided within each of the trolleys that support a seating portion. A recess 18b and a literature pocket 18c are also provided above the storage hatch 18a.

To provide privacy between the two seating units 2a and 2b the seating unit 2a is provided with a petal or blade-like privacy screen 11a and the seating unit 2b is provided with a corresponding privacy screen 11b (see Figures 1 and 2). The privacy screen 11a is pivoted to the first side wall 6a of the housing 6 at a pivot point 12. The privacy screen 11b is similarly pivoted at a pivot point (not shown) to the second housing 16. Each privacy screen 11a, 11b dissects the common axis of the first arm rests 10a and is rotatable about its respective pivot point in a plane defined by the respective first side wall 6a, 16a. The sense of rotation of the privacy screens 11a, 11b is indicated by the arrows D-D and E-E respectively in Figure 1.

Ideally, each of the privacy screens 11a and 11b is rotatable to block eye-to-eye contact between adjacent passengers when either of the seating units is in any configuration between fully upright and fully reclined positions. Each privacy screen can be fixed in a desired position by a suitable détente mechanism (not shown). Of course, should adjacent passengers wish to converse with each other, then the privacy screens 11a, 11b can be suitably positioned to allow eye contact between the passengers.

Preferably, each of the privacy screens 11a and 11b is composed of a lightweight flexible material so that in the event of an emergency, the screen can be easily rotated out of the way, or if necessary pushed to one side, to allow access to oxygen masks released from overhead compartments. One

known material having these properties from which a privacy screen may be constructed is Tufnol(RTM).

As is shown in Figure 3 of the accompanying drawings, the first seating unit 2a is provided with a one-piece table 13 which is positionable to extend across the seating unit 2a over the lap of a passenger (not shown). The table 13 is stored in a known manner in the arm rest 10b. The table 13 is pivotally mounted to the arm rest 10b of the seating unit 2a by a knuckle joint (not shown). To deploy the table 13 from the stored position the table 13 is first rotated in the plane of the arm 10 out of the storage area and then rotated down over the passenger's lap. When deployed, the joint connecting the table to the arm rest allows the table to be slid perpendicular to the arm 10, in a fore and aft direction (indicated by the arrows F-F) to a position at which the passenger is comfortable. The table 13 can also be rotated in a plane parallel to that of the cabin floor between the position in which the table 13 extends across the seat (shown in full lines), to a position (shown in broken lines) in which the table 13 extends parallel to the axis of the seat. This allows for easy access to and from the seat without a passenger having to return the table 13 to the storage area.

The table 13 includes at one end a fin-shaped projection 14 shaped and positioned to rest on the arm rest 9 of the seating unit 2a when the table 13 extends across the seating unit 2a. Preferably, the projection 12a is made of a resilient material so that when the table 13 supports a load, and the projection 14 rests on the arm rest 10a the arm rest 10a is not damaged.

Traditionally, in-flight entertainment devices, such as display screens, headphone points and the like have been mounted to the arm rests of aircraft seats. Accommodating such devices at arm rests has resulted in arm rests that are wider than would be otherwise necessary just to support the arms of an occupant. This is an inefficient use of space. Each of the seating units 2a and 2b is therefore provided with a self-contained in-flight entertainment unit 15a

and 15b respectively, each of which is positioned in front of its corresponding primary seat 4 and fixed to the housing of the adjacent seating unit. Such an entertainment unit, is shown in detail in Figures 5a to 5c, comprises a housing 20 containing a display monitor 21, headphone points 22, a PC power point 23, a cocktail table 24 and a reading light 25.

The display monitor 21 on which a passenger may watch in-flight movies and the like is pivotally connected to the housing 20 by a support arm 21a. The support 21a is rotatably hinged to the housing 20 and may be rotated to move the display screen 21 from a stored position shown in Figure 5a, in which the screen 21 fits snugly in a recess 21b in the housing 20, to a deployed position shown in Figure 5b, in which the screen faces the passenger in the seat. The display screen 21 is itself rotatably mounted to the support arm 21a and can be rotated about the axis of the support arm 21a thereby allowing the passenger to position the screen at a comfortable viewing angle depending on whether the passenger is sitting up or lying down. A rotatable latch 21c is provided to lock the display 21 in the stored position for take off and landing.

The cocktail table 24 is positioned above the support arm 21a to avoid drinks placed on the table 24 being spilt accidentally during adjustment of the position of the display 21. The cocktail table 24 is hinged to the housing 20 by a hinge connection 24a and is movable between a stored position in which the table 24 fits snugly in a recess 24b formed in the housing 20, as is shown in Figure 5c, and a deployed position in which the table 24 extends from the housing 20, as is shown in Figure 5a. A rotatable latch 24c is provided to latch the table 24 in the stored position. The headphone 22a and PC power points 23 are suitably positioned to minimize the risk of headphone and PC cables becoming tangled, when such devices are being used.

The reading light 25 is positioned on the top of the housing 20 and is arranged to direct light downwards towards the primary seat of the other seating unit.

Advantageously, access to the rear of an entertainment unit for maintenance or removal of the unit is achieved by unclipping the back portion of the housing of the adjacent seating unit and removing the back portion from its seating unit and the pallet on which the seating unit is placed. After a unit has been repaired or replaced the back portion is clipped back into place.

How a passenger chooses to configure his or her seat during normal flight is entirely up to the passenger and to this end, the primary seat is drivable between any position between upright and fully reclined. Furthermore, each seating unit also has a plurality of predetermined modes associated therewith into which the seating unit is automatically moved by use of a control pad. In each mode, the backrest 4 and the seat portion 8 of a seating unit are fixed at predetermined angles to the vertical and horizontal respectively, horizontal being defined by the plane of the cabin floor. Figures 6a to 6e each show the seating unit 2a in a different predetermined seating mode. For reasons of clarity, the trolley supporting the seating portion 8 of the seating unit 2a is not shown.

During take off and landing an aircraft is inclined at about 15° to the horizontal. If the seating units were designed so that the seating portion and the back portion were parallel with and perpendicular to the cabin floor respectfully, a passenger of a rearward facing seat would feel that during take off that he or she were slipping forward out of their seat. This is undesirable, because passengers would understandably find such a sensation uncomfortable.

In order to avoid such a problem, one of the modes in which a seating unit can be configured is a taxi, take off and landing (TTOL) mode which is shown in Figure 6a. In this TTOL mode, which passengers would be required

to adopt during taxiing, taking off or landing, the seat portion 8 is inclined at a predetermined angle to the horizontal, and the back portion 4 is inclined at a predetermined angle to the vertical to compensate for the take-off angle of the aircraft and thus leave a passenger feeling comfortable in his or her seat. Studies have shown that passengers find that having the backrest inclined at 30° to the vertical and the seat rest inclined at 15° to the horizontal is particularly comfortable and also acceptable for safety reasons. Preferably, each seat carries solenoid actuated shoot bolts (not shown) which mate with apertures in the seat guide tracks (not shown) to lock the seat in the TTOL position, thereby providing security for the passenger during taxiing, take of and landing.

During the course of a flight passengers will spend some time working and some time eating and drinking. One of the predetermined modes that the seats is designed to adopt is a working and eating mode which is shown in Figure 6b. In the working and eating mode, the back portion 4 is more upright than it is in the TTOL mode, and the seating portion 8 is less inclined to the horizontal than it is in the TTOL mode. This is necessary because passengers would find the orientation of the back and seat portions in the TTOL mode uncomfortable for working or eating in. Preferably, but not essentially, in the working and eating mode the backrest 8 is inclined at about 13° to the horizontal and the seating portion is inclined at about 4° to the horizontal.

Should passengers find their posture in the working and eating mode uncomfortable, there is also provided a less upright working and eating mode in which the seating unit 2a is shown in Figure 6c. In this mode, the back portion 8 is preferably inclined at about 20° to the vertical and the seat portion 4 is at inclined about 10° to the horizontal.

Figure 6d shows a seating unit 2a in a half reclined mode in which it is envisaged that a passenger can comfortably relax to watch in-flight

entertainment on the display monitor or to read. Preferably, in this mode, the back portion is inclined at about 25° to the vertical and the seat portion 8 at about 12° to the horizontal.

Figure 6e shows the seat 2a in a bed mode similar to that already shown in Figure 2a. In this mode, the primary seat 14 and the secondary unit 5 form a substantially flat surface.

Figures 7a to 7e of the accompanying drawings depict a secondary unit 50 which is shown in more detail than the secondary unit 5 shown in Figures 1 to 3. The secondary unit 50 comprises a pad 51 supported by a support member 52 which is anchored to a base part 53. The support member 52 comprises a first portion 52a which supports the pad 51 and a second portion 52b on which the first portion 52a is slidably mounted. The second portion 52b is securely attached to the base part 53.

In use, the pad may be raised and lowered to any position between the raised position shown in Figures 7a and 7b and the lowered position shown in Figure 7c. This is achieved by manually sliding the first portion 52a of the support member over the second portion 52b. Preferably, the secondary unit is configured so that if a predetermined minimum excessive force is exerted thereon, for instance three hundred pounds, then the unit is automatically lowered to the lowered position.

When in the upright position, the pad 51 can co-operate with a primary seat to form a flat surface, as is shown in Figure 2a.

The pad 51 is pivotally connected to the support 52a at a pivot 54. This allows the pad 51 to be pivoted between the horizontal position shown in Figure 7b and 7c and the vertical position shown in Figure 7d. It is envisaged that the pad 51 will be placed into the vertical position for take off and landings and also to allow passenger egress from a seat. In the vertical position, the footpad can be latched, to the back of the housing (not shown) of the next seat in front or to a bulkhead or other fixed structure within the cabin.

Figure 7e shows a plan view of the pad 51. The pad 51 is angled in shape to allow a passenger to place his or her legs on the cabin floor on each side of the pad. This allows the passenger to leave the seat without necessarily having to flip the pad into the stored position show in Figure 7d. This is possible because the front edge 55 of the pad 51 is wider than the back edge 56.

Preferably, the base part 53 is pivotally connected to the cabin floor at a pivot point 57. The whole of the secondary unit is rotatable about pivot point 57 for off centre rotation through 90° in the plane of the cabin floor. The rotation of the secondary unit in this plane allows a passenger more easily to change position in a seat during a flight. Full support of the passenger's legs on the secondary unit produces even pressure on the legs which in turn reduces circulation over a period of time. The rotation allows the passenger to avoid such discomfort as a "dead leg" feeling when getting up out of a seat.

Furthermore, this rotation about the point 57 allows the pad to be rotated from a position in which its front edge 51 faces towards the primary seat of the seating unit, to a position where its front edge 51 faces away from the primary seat. This is illustrated in Figure 8 of the drawings, where the front edge 61 of a secondary unit 60 faces a primary seat 63 and a secondary unit 64 has been rotated or swivelled through 90° so that its front edge 66 faces away from the primary seat 65.

When a primary seat is moved to a fully extended position, in order to form a bed with its secondary unit, it is preferable that the secondary unit is aligned with the primary seat so that the front edge of the unit faces the primary seat. In this configuration maximum support is given to the legs of a passenger. It would be inconvenient for a passenger to have to get up from a primary seat to correctly align the secondary unit each time a seating unit is put into the bed mode. Therefore, preferably each seating unit is arranged so that as the primary seat moves into bed mode, if the secondary unit is not

aligned with the primary seat, then, the secondary unit is automatically caused to swivel until the front edge of the unit faces the primary seat. One mechanism for achieving this is shown in Figure 9 of the accompanying drawings. Figure 9 shows a plan view of a seat portion 71 approaching a secondary unit 74 which is misaligned with the seat and has a pad 75 with a front edge 76 facing away from the seat.

The seat portion 70 is carried by a trolley 71 which runs in tracks 72a, 72b on the cabin floor. The trolley 71 has a pusher 73 extending therefrom which runs ahead of the trolley in the track 72a. The secondary unit 74 has a base 77 on which the pad 74 is supported by a support 78. The base 77 is pivotably mounted to the cabin floor at a pivot point 79. The base 77 of the secondary unit 74 is shaped so that as the seat portion 70 and the trolley 71 approach the unit 74, if the front edge 76 of the pad 75 is misaligned with the seat portion 70, the pusher 73 contacts the base 77 exerting a force thereon which causes the base 77 to swivel anti-clockwise about the pivot point 79 until, when the seat portion 70 reaches its fully extended position, the secondary unit 74 has been swivelled until its front edge 76 faces the seat portion 70.

Turning now to Figure 10 of the accompanying drawings, there is shown a partial cut away section of a secondary unit 80 including a mechanism for raising and lowering the secondary unit 80, between a fully upright position and a fully lowered position. The unit 80 comprises a first support 81 in the form of an elongate rod which is slidably mounted in a tube like second support 82. The first support 81 carries at one end a footpad, which for reasons of clarity is not shown, and at the other end is attached to a metal yoke 83. The second support 82 contains a pair of spaced apart upright supporting rods 84 each of which passes through a respective one of a pair of holes (not shown) formed in the yoke 83. The yoke 83 thus bridges the supporting rods 84 and the fit between each rod and hole is loose enough to

allow the yoke 84, and thus the first support 81 and the pad, to be slid between the fully raised position (shown in full lines) and the fully lowered position, (shown in broken lines).

The first support 81 and the yoke 83 can be locked at any position between the fully raised and fully lowered positions by means of a "mech lock" 85 attached to the yoke 83. The "mech lock" 85 is operated by an activating handle (not shown) fixed underneath the footpad (not shown), the handle being connected to the "mech lock" 85 via an operating cable 86. Preferably, the lock is configured to release if a force of three hundred pounds or more is applied to the unit. "Mech locks" are well known in the art and will not be discussed any further herein. Preferably, the first support 81 and the cable are surrounded by a protective casing (not shown), which shields the first support 81 and the cable 86 from view and which, as the first support 81 is raised and lowered, slides over the outer surface of the second support 82.

One possible cabin arrangement for the seating units described hereinabove shown in Figure 11. In this arrangement, pairs of seating units 1 are arranged in rows A, B, extending across the width of the cabin, and plural lines C, D, E, F along the length of the cabin. Each row comprises four pairs of seating units 1 extending across the width of the cabin. In Figure 9, only two rows A and B of pairs of seating units are illustrated although of course there would be many more rows on an actual aircraft. The first and second pair and the third and fourth pair in each row are separated by aisles 92, which provide access to the seating units and of course, allow passengers and attendants to walk up and down the cabin. Each of the seating units which is adjacent to an aisle faces towards the front of the cabin, whereas the non-aisle seats face towards the rear of the cabin.

Having thus described the present invention by reference to a preferred embodiment it is to be well understood that the embodiment in question is exemplary only and that modifications and variations such as will occur to those possessed of appropriate knowledge and skills may be made without departure

from the spirit and scope of the invention as set forth in the appended claims and equivalents thereof.

CLAIMS:

1. A seating unit for a vehicle the seating unit comprising a pair of seats facing in opposite directions with each seat comprising a seating space for receiving the seated body of an occupant and an extension space in which the legs of an occupant may be placed, the seats being positioned each side of a notional dividing axis with the seating space of one extending over the axis at the extension space of the other.

2. A seating unit according to claim 1, wherein the pair of seats is arranged so that one of the seats will face substantially forward when fitted in a vehicle and the other of the seats will face substantially aft.

3. A seating unit according to claim 1, wherein each of the seats comprises an arm rest, with the arm rest of one of the seats arranged along a common axis with the arm rest of the other seat.

4. A seating unit according to claim 3, wherein the common axis is substantially coincident with the notional dividing axis between the seats.

5. A seating unit according to any of claims 1 to 4, wherein the pair of seats are contained within a housing or each seat is contained within a respective housing, the housing or housings bounding the seating spaces and the extension spaces, and forming a wall between the seats, which wall is offset with respect to the notional dividing axis of the seats.

6. A seating unit according to any preceding claim, in which each of the seats comprises a back portion and a seat portion and wherein the seating portion of each seat is movable to allow the back portion of each seat to be reclined.

7. A seating unit according to claim 6, further comprising an extension unit in each of the extension spaces positioned to face the respective seat.

8. A seating unit according to claim 7, wherein the seating portion of each seat is movable to a fully extended position to allow the back portion to recline to a fully reclined position so that together the extension unit, the seat portion and the back portion form a flat surface.

9. A seating unit according to any preceding claim, wherein the seating unit is for an aircraft.

10. A pair of seats, one for facing forward and the other for facing aft when fitted in an aircraft, each seat defining a major occupancy area and a minor occupancy area extending away from the major occupancy area along a seat axis and comprising a wall to one side of the major occupancy area, the seats being positioned adjacent to each other such that the walls of the seats share a common axis offset with respect to the seat axes to define a major occupancy area in one of the seat which is larger than the minor occupancy area in the other of the seats.

11. A seat for use in an aircraft cabin, the seat comprising a back pan and a seat pan operable together to a plurality of different positions including a take-off position at which the seat pan is inclined to the floor of the cabin to compensate for the take off angle of the aircraft.

12. A seat according to claim 11, wherein the seat is for facing aft when fitted in an aircraft cabin.

13. An aircraft seat according to claim 11 or 12, wherein the seat is drivable between a plurality of different modes including a take-off mode in which the seat pan is in the take-off position and in which the back portion is partially reclined the take off mode being between a fully reclined mode in which the back pan is fully reclined and a fully upright mode in which the back portion is fully upright.

14. A seat according to claim 11, 12 or 13, wherein the seat pan is less inclined to the horizontal when the seat is in the fully upright mode than when the seat is in the take-off mode.

15. An aircraft seat as claimed in any of claims 11 to 14, comprising latching means for latching the seat in position in the take off mode during take-off.

16. A secondary unit for use in an aircraft cabin with an aircraft seat, the unit comprising:

a pad mounted on an elongate support, the support being of variable height, whereby the elevation of the pad above the cabin floor can be altered.

17. A secondary unit according to claim 16, wherein the pad is supported for rotation in a plane substantially parallel to that of the cabin floor.

18. A secondary unit according to claim 16 or claim 17, wherein the pad is mounted to the support for pivotable movement about an axis substantially perpendicular to the support between a deployed position and a latched position.

19. A secondary unit according to claim 18, wherein the pad in the deployed position is substantially parallel to the cabin floor and in the latched position is substantially perpendicular to the cabin floor.

20. A secondary unit as claimed in any of claims 16 to 19, wherein the support comprises means arranged to lower when a load in excess of a predetermined maximum is applied to the unit.

21. An aircraft seating unit comprising:

a reclinable primary seat; and

a secondary unit as claimed in any of claims 16 to 20 facing the reclinable primary seat.

22. An aircraft seating unit as claimed in claim 21, wherein the primary seat is reclinable to a position in which the primary seat and secondary unit co-operate to form a flat surface.

23. A seating unit for an aircraft cabin, the unit comprising;
a seat movable between a retracted position and an extended position;
a footrest that is movable into and out of alignment with the seat; and
a footrest actuator arranged to move the footrest into alignment with the seat, when the seat is moved towards the extended position.

24. A seating unit according to claim 23, wherein the footrest actuator comprises a projection that extends forwardly from the seat which contacts the footrest when the seat is moved towards the extended position.

25. A seating unit according to claim 24, wherein the seating unit comprises a carriage for moving the seat and where the projection extends forwardly from the carriage.

26. A seating unit according to claim 25, wherein the seating unit comprises tracks mountable to a cabin floor for the carriage to move along to move the seat, with the projection extending from the carriage along one of the tracks.

27. A seating unit according to any of claims 23 to 26, wherein the footrest comprises a base mountable to a cabin floor for rotation in the plane of the cabin floor and wherein the projection is arranged to contact the base of the footrest to rotate the footrest into alignment when the seat is moving towards the extended position.

28. A seating unit according to any of claims 23 to 27, wherein the seat comprises a reclinable back portion and a seat portion and when the seat is in the extended position the back portion, seat portion and the footrest together form a substantially flat surface.

29. An in-flight entertainment unit comprising:

a housing;

a monitor supported on the housing by a support arm, the support arm being rotatable about the housing to move the monitor between a stored position and a viewing position and the monitor being rotatable about the support arm to vary a viewing angle when in the viewing position.

30. An in-flight entertainment unit according to claim 29, further comprising a cocktail table mounted on the housing and movable between deployed and undeployed positions.

31. An in-flight entertainment unit according to claim 29 or 30, further comprising one or more of a computer power point, an audio output jack and a condition indicator.

32. An in-flight entertainment unit comprising in a self-contained unit which facilitates maintenance of the unit two or more of the following, namely:

a monitor;

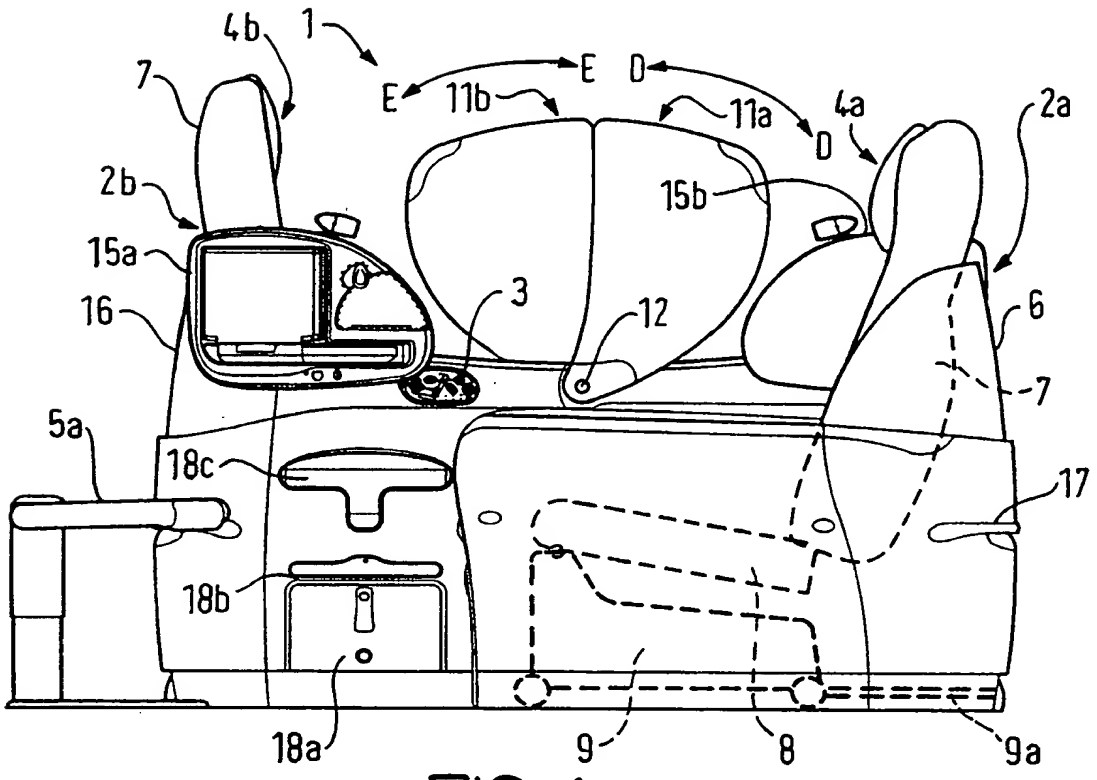
a computer power point;

a cocktail table;

a condition indicator; or

an audio output jack.

33. An entertainment unit in combination with a seating unit as claimed in any of claims 1 to 9, wherein the unit for one seat is mounted in a housing associated with the other seat.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9a

FIG. 1

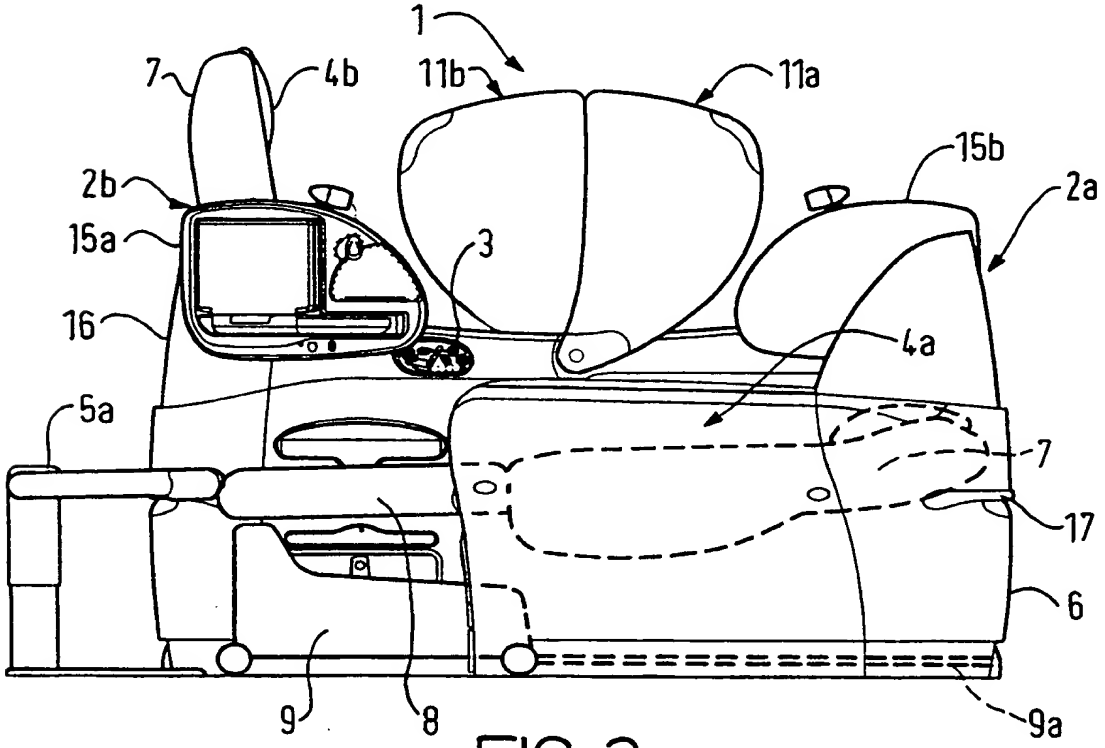
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FIG. 2

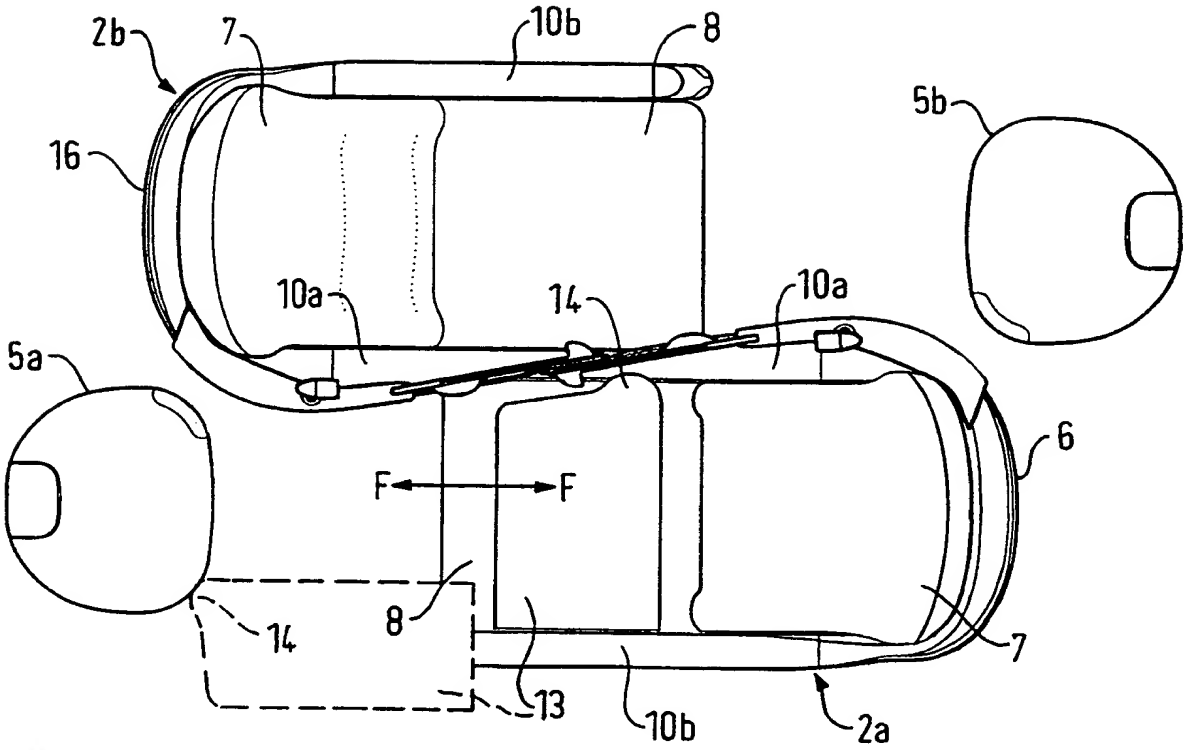
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FIG. 3

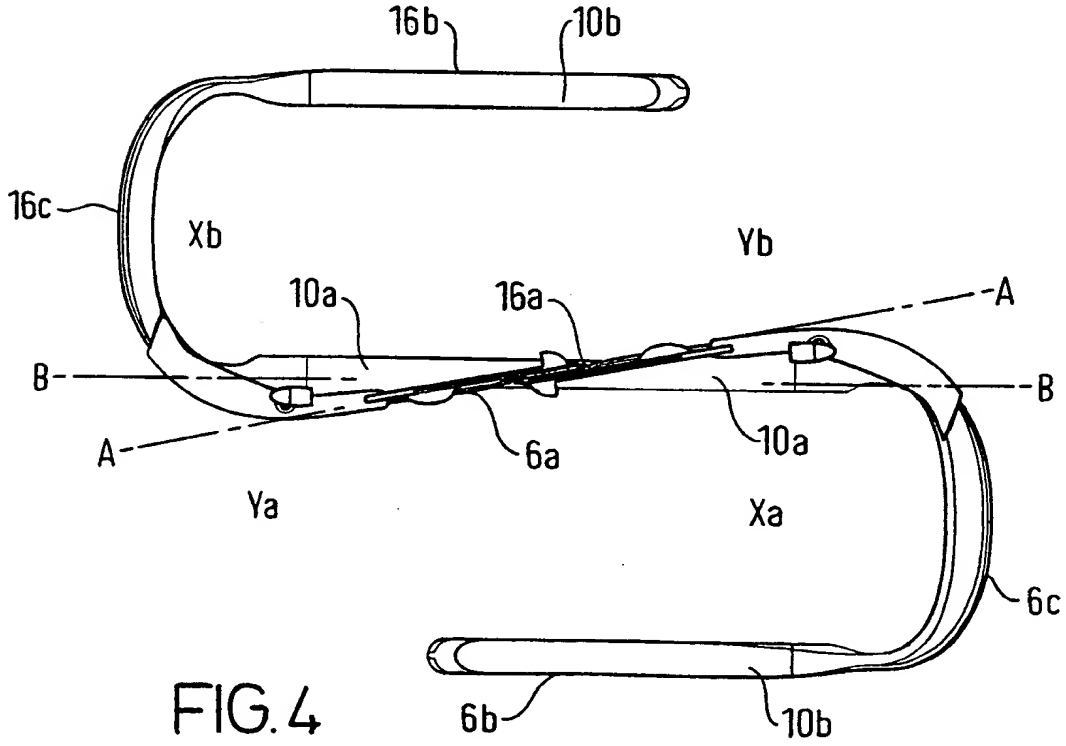
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FIG. 4

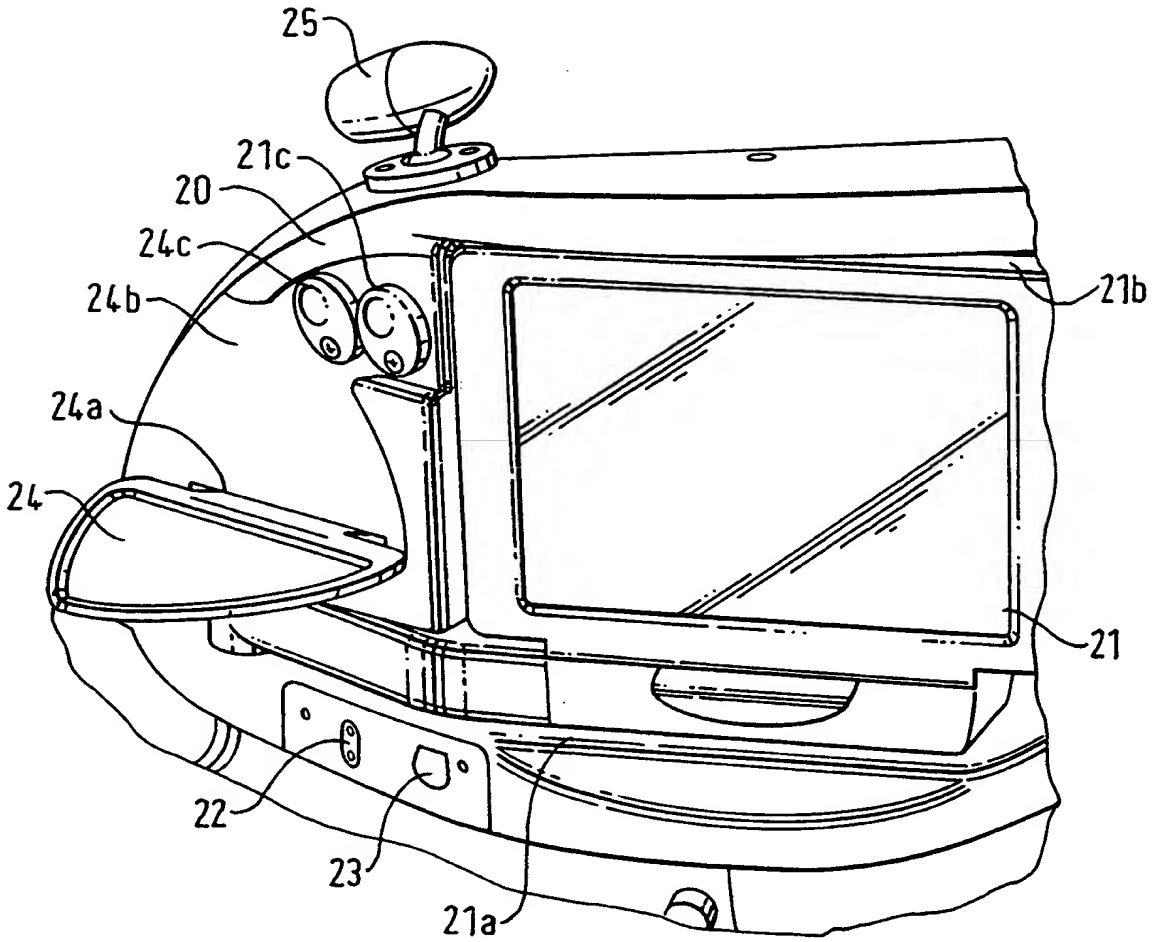

FIG. 5a

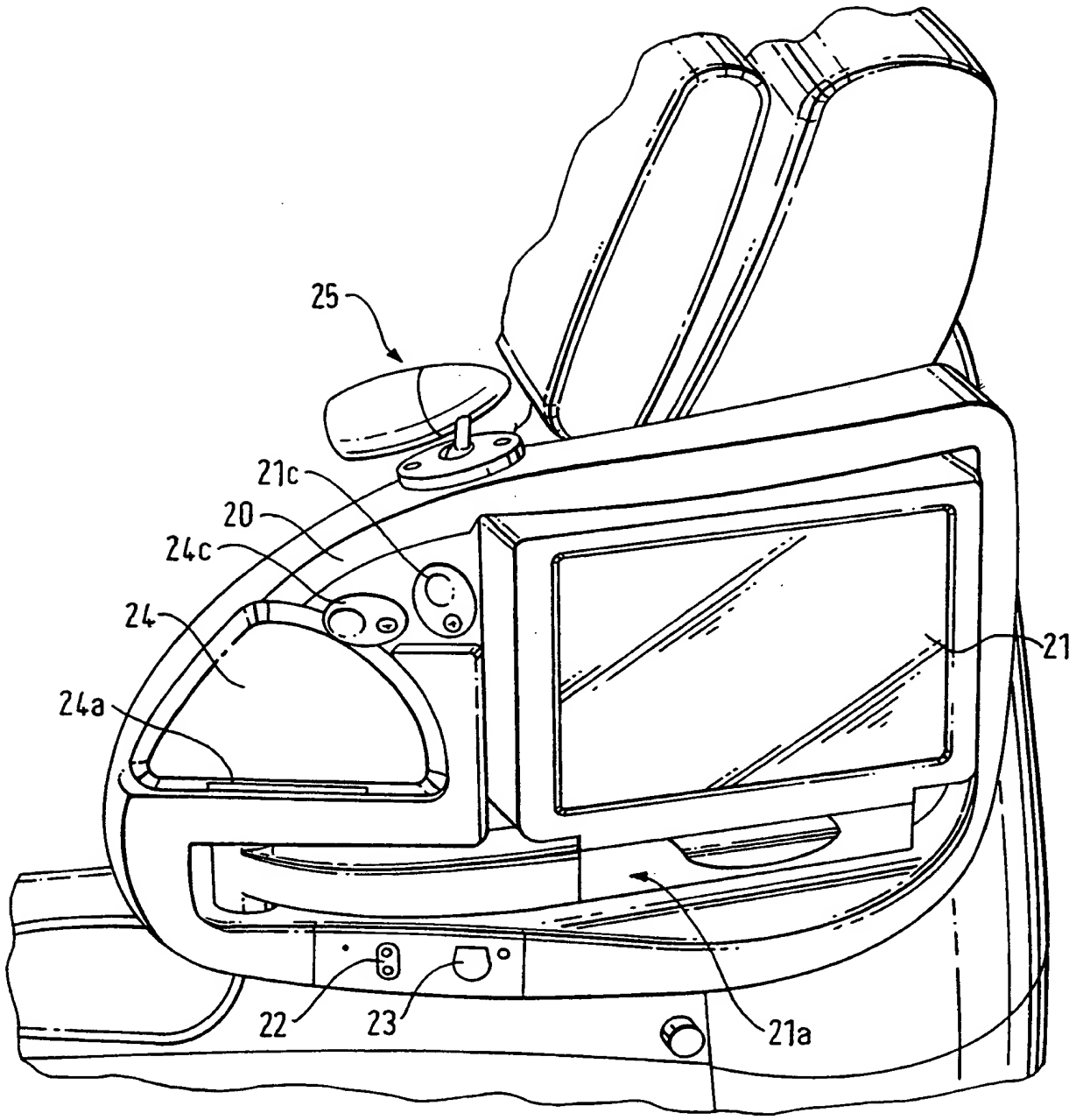

FIG. 5c

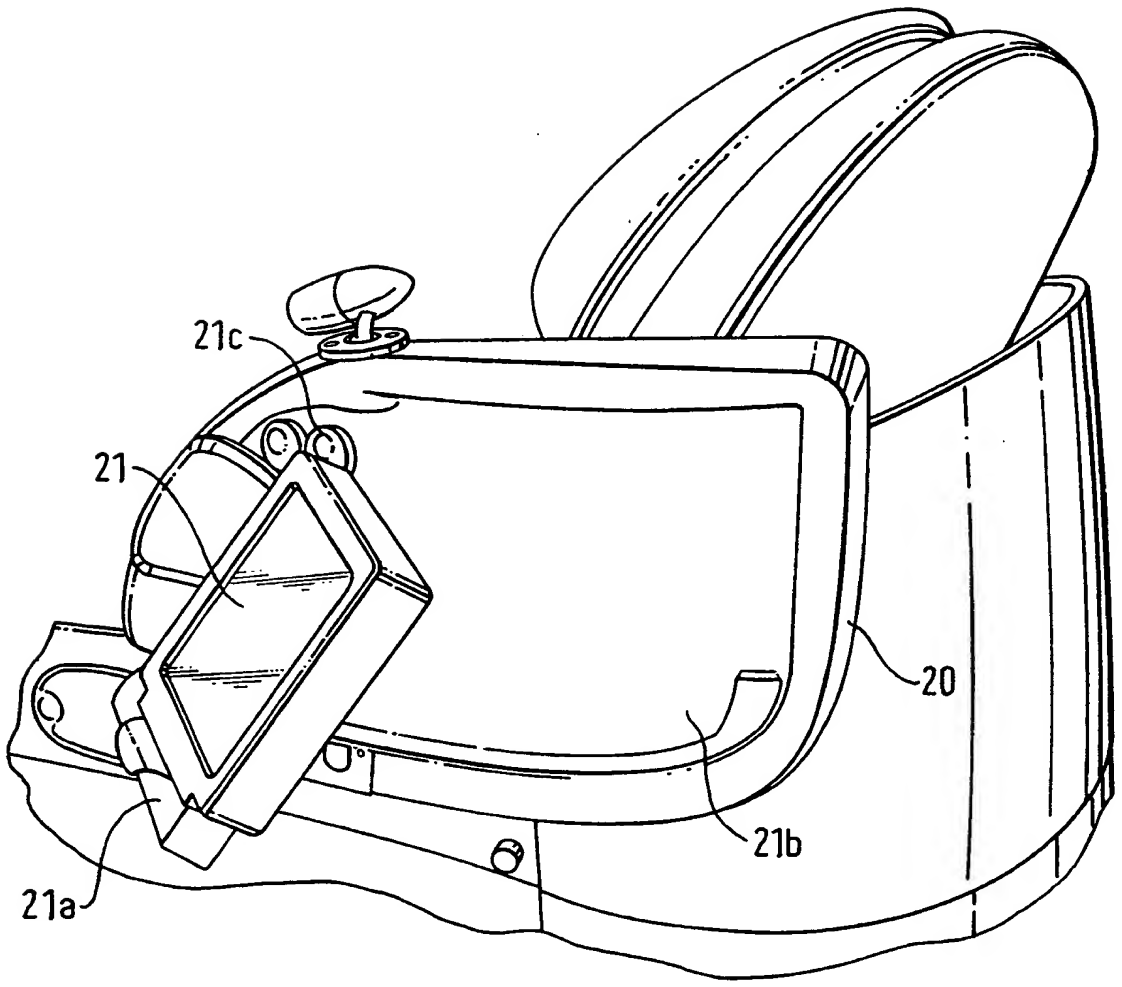

FIG. 5b

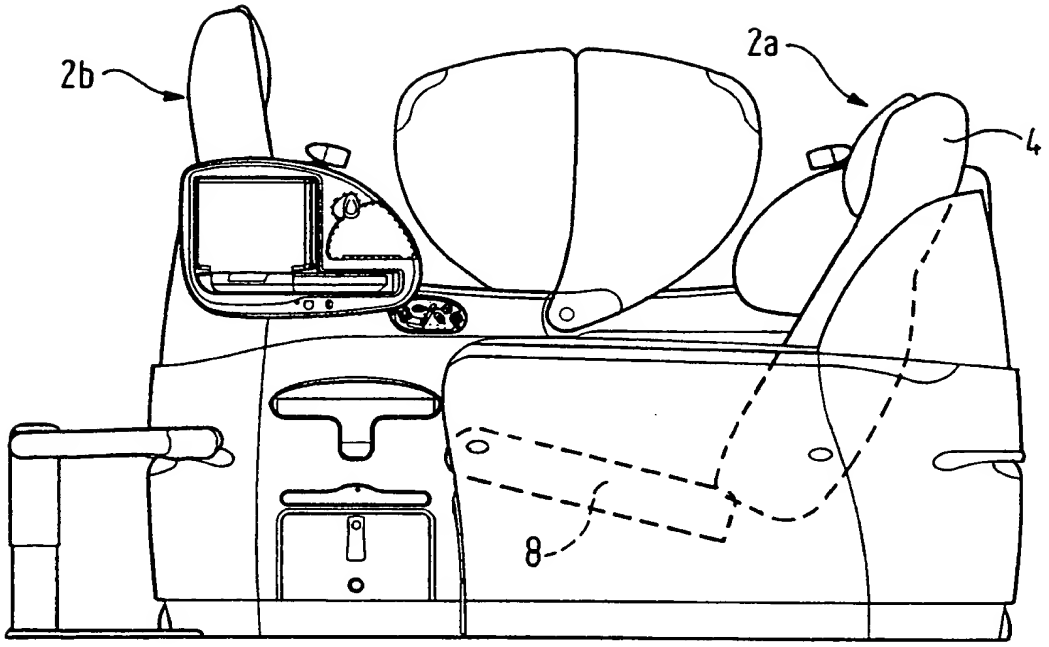

FIG. 6a

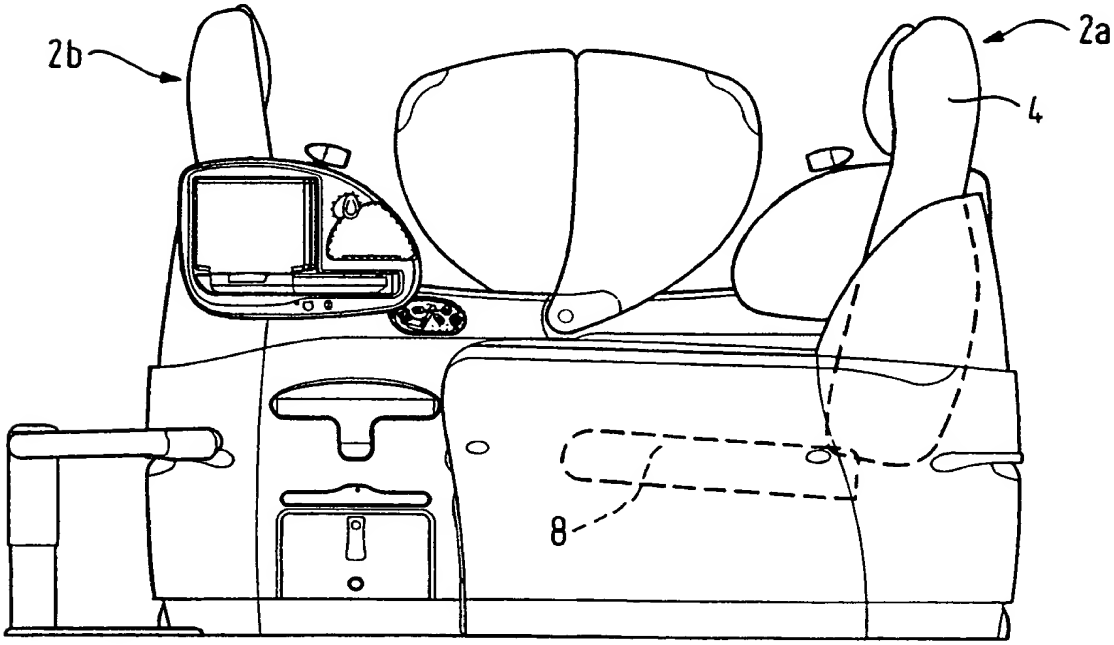

FIG. 6b

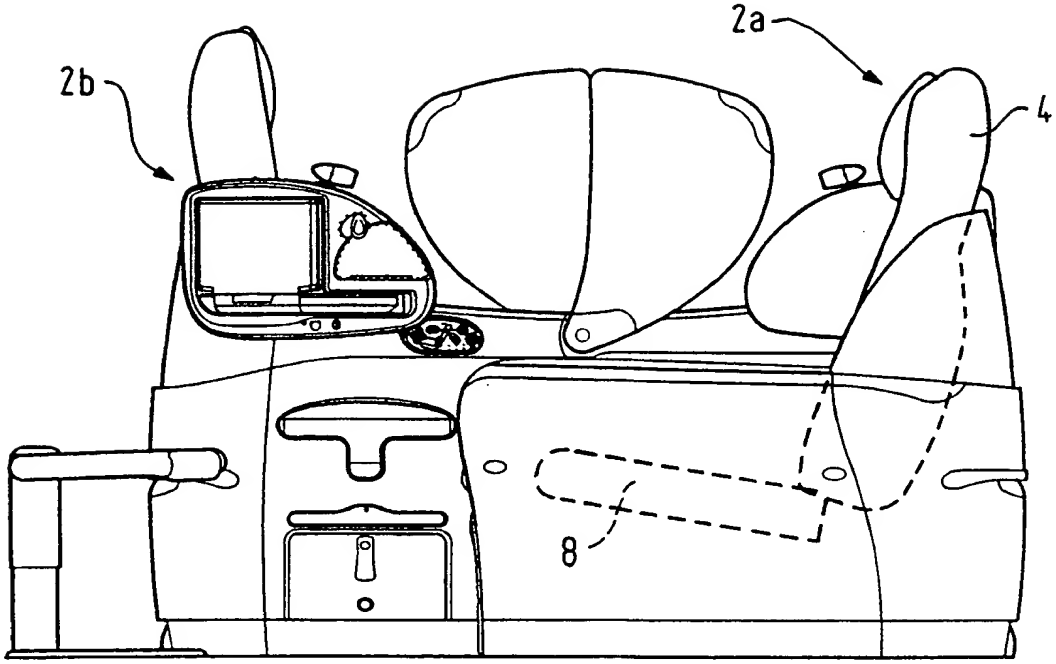

FIG. 6c

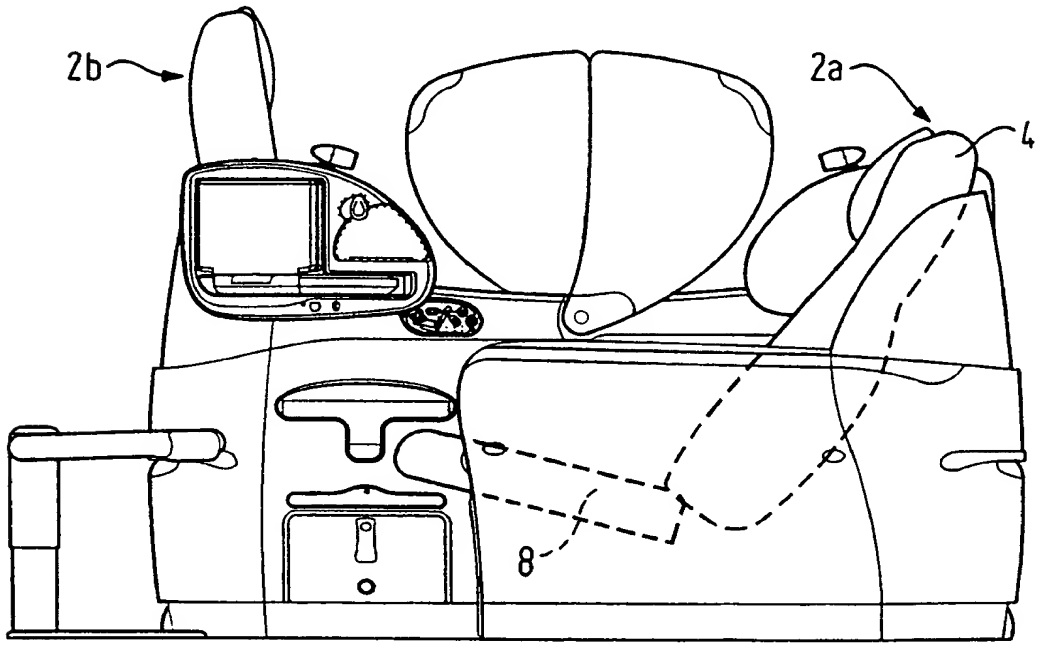

FIG. 6d

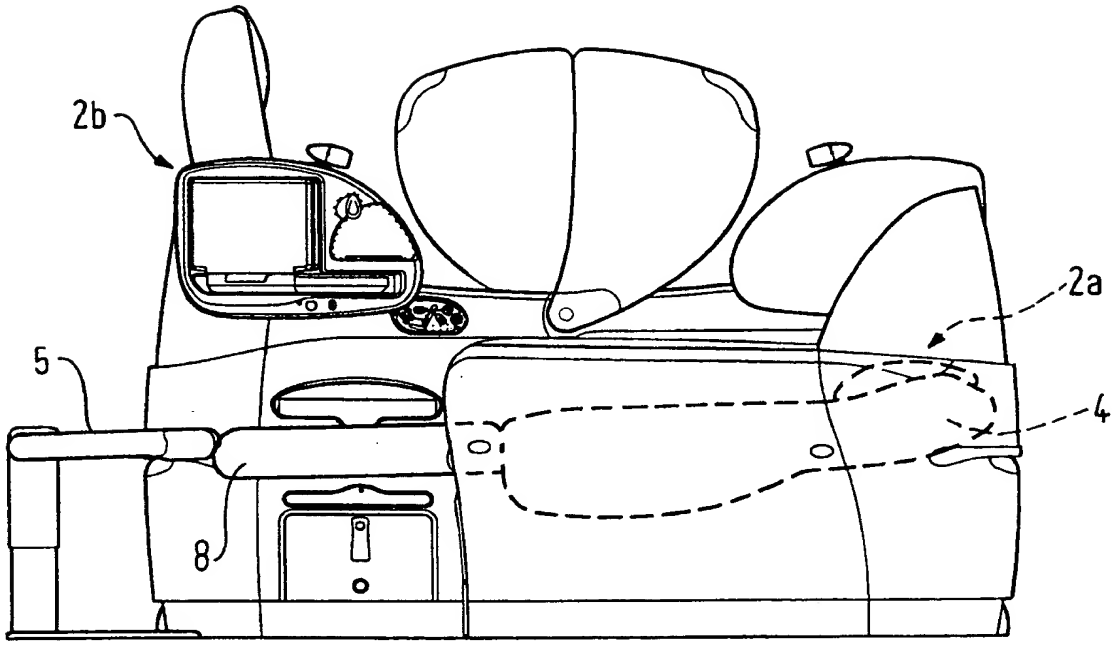

FIG. 6e

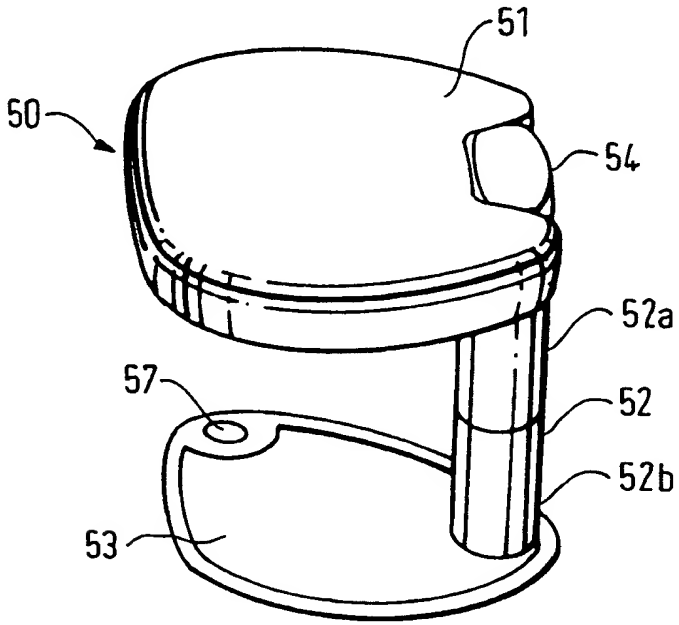

FIG. 7a

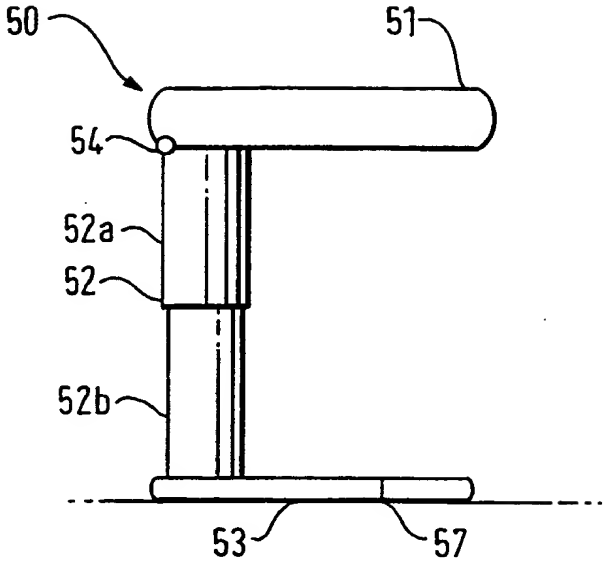

FIG. 7b

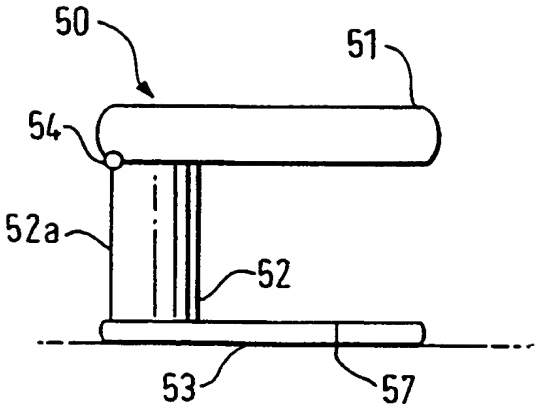

FIG. 7c

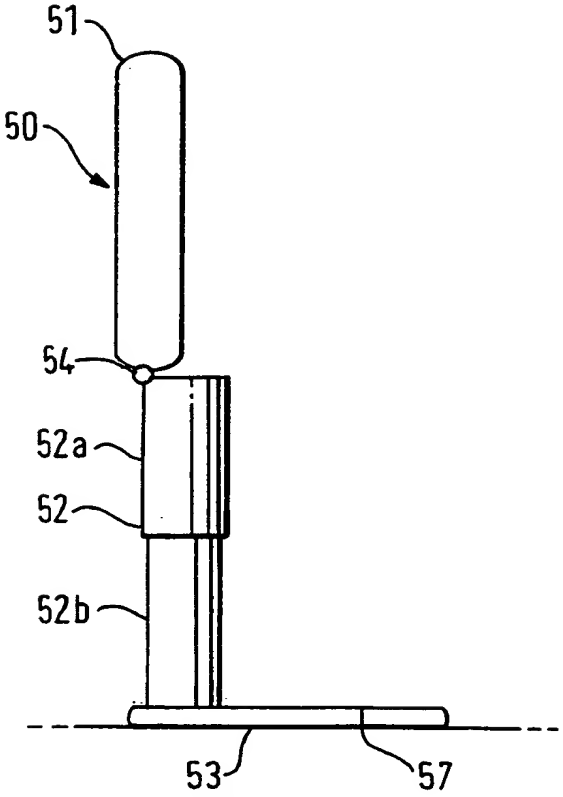

FIG. 7d

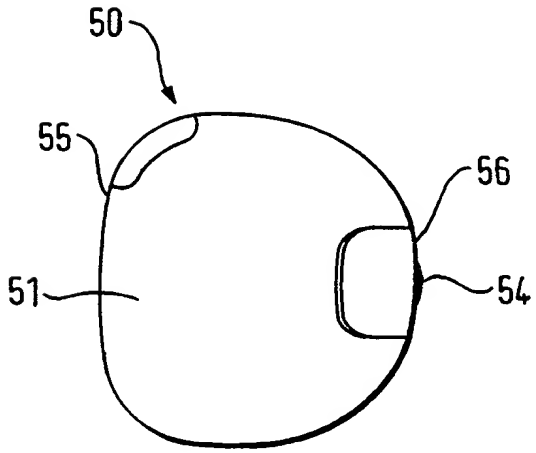

FIG. 7e

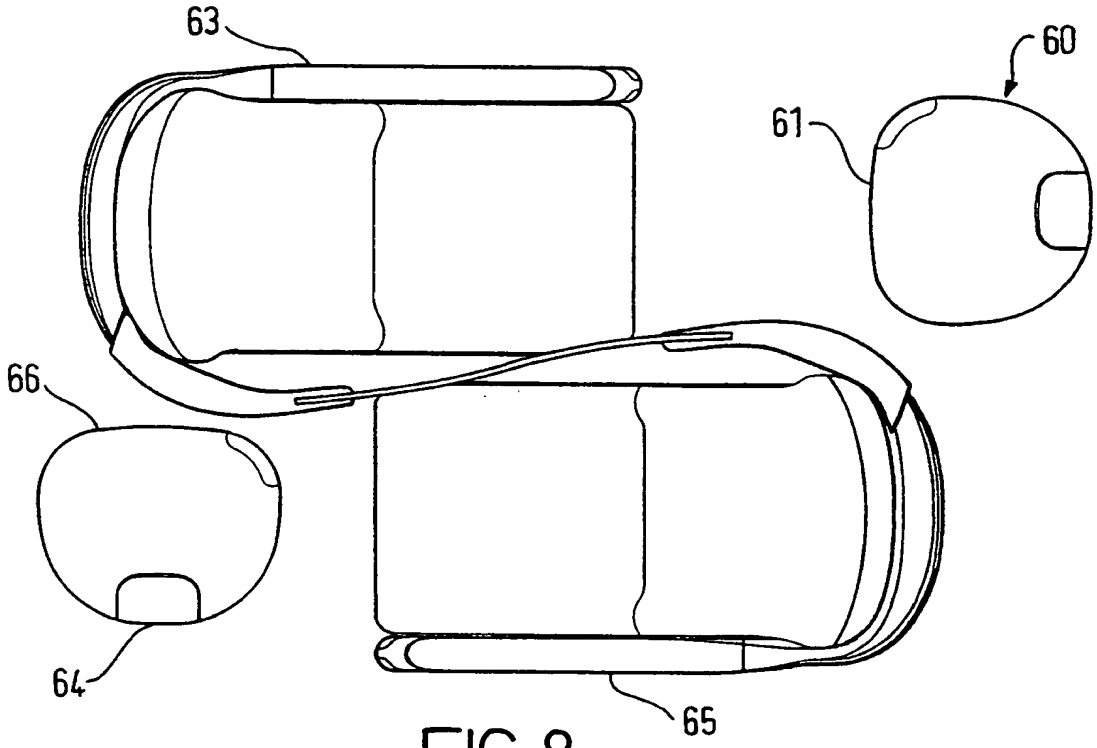

FIG.8

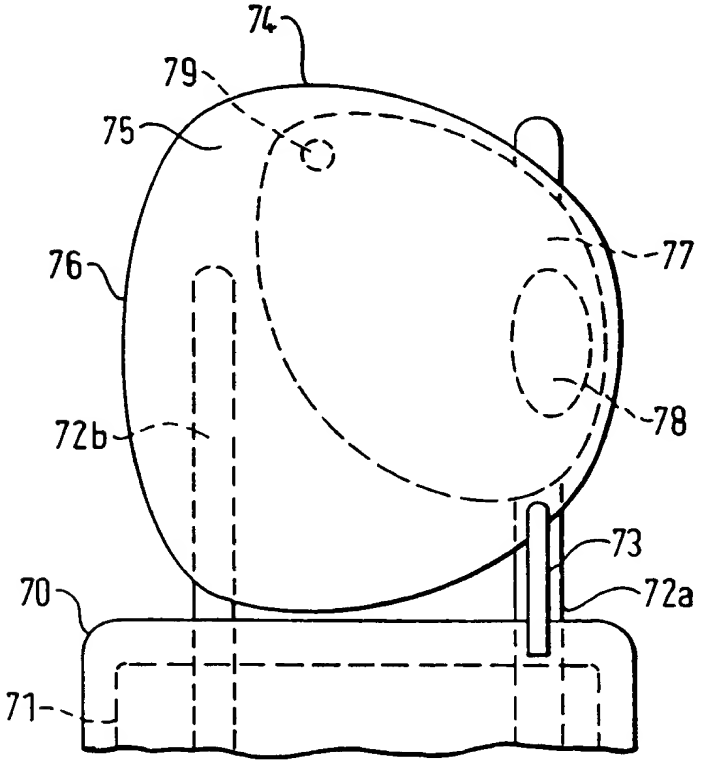

FIG.9

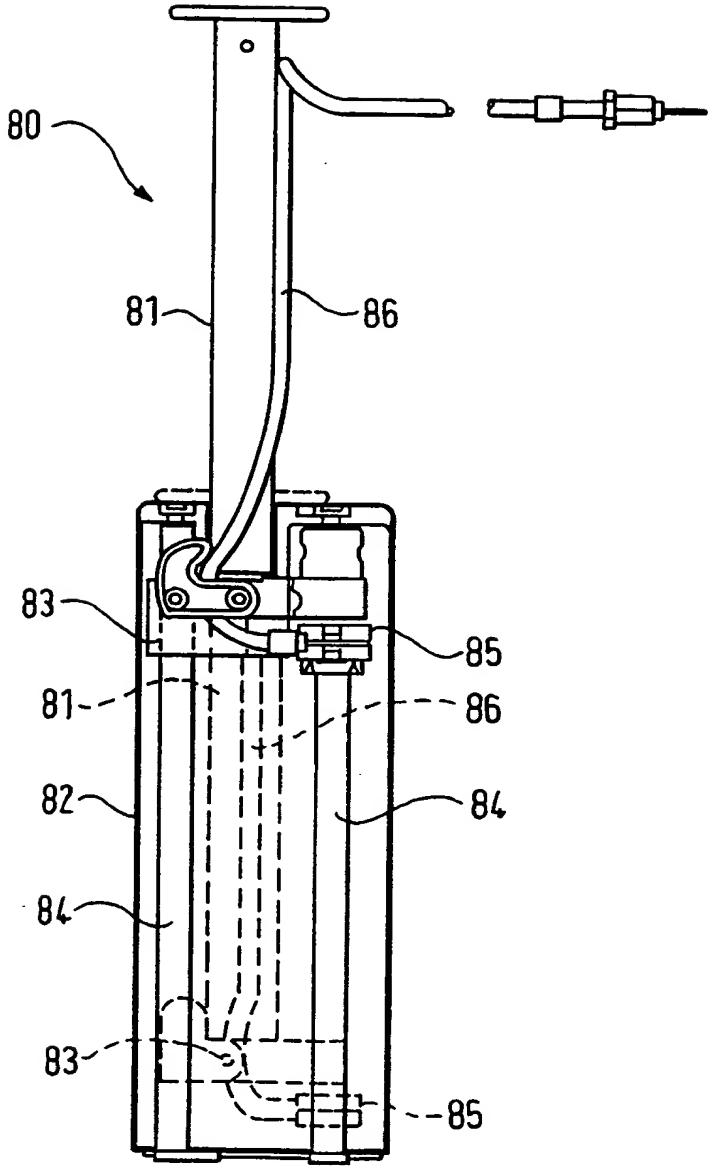

FIG. 10

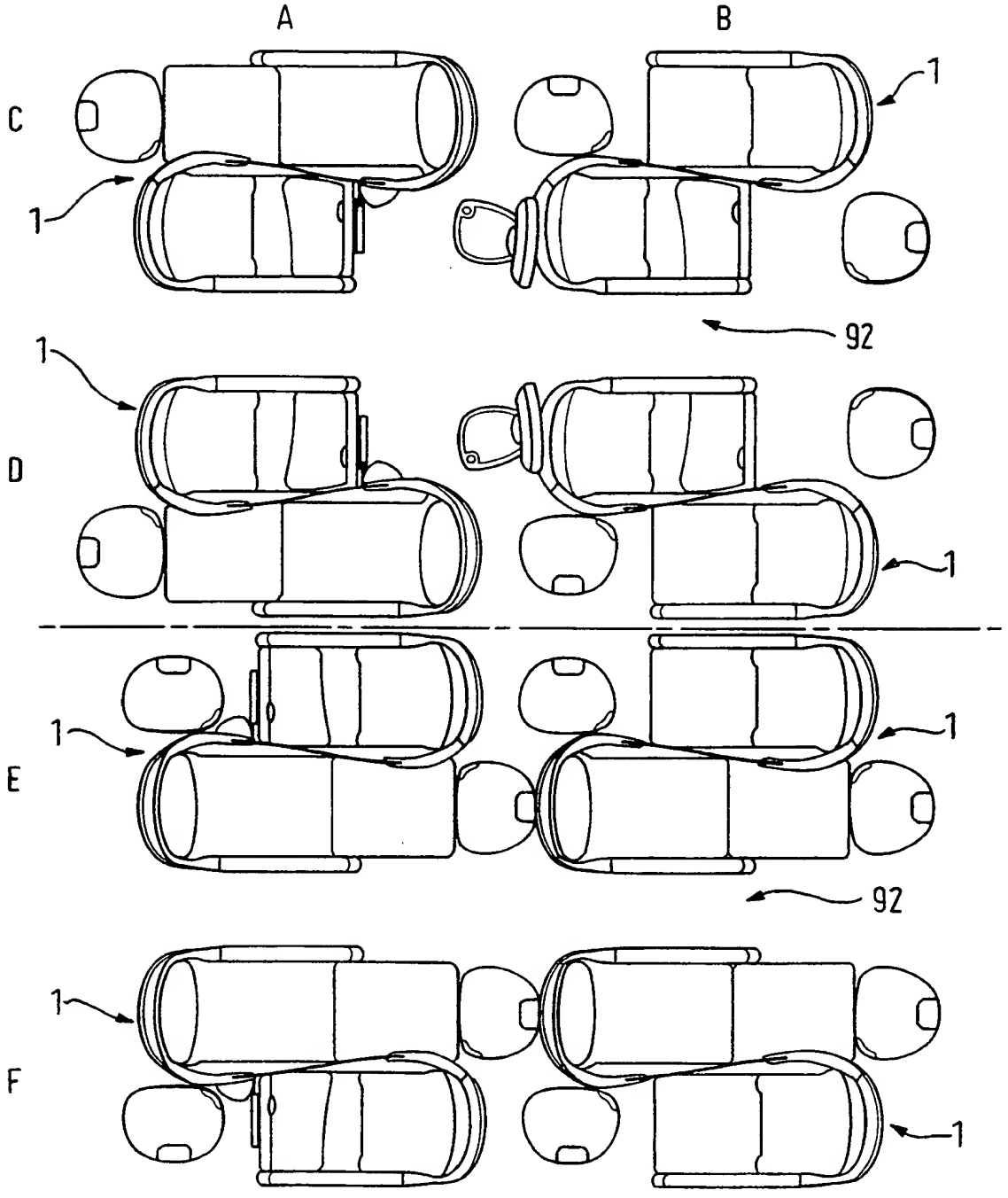

FIG. 11

PATENT COOPERATION TREAT

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE COMMUNICATION OF THE INTERNATIONAL APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:
WHITTEN, George, A.
R.G.C. Jenkins & Co.
26 Caxton Street
London SW1H 0RJ
ROYAUME-UNI

R. G. C. JENKINS & CO.
★ - 2 MAY 2000 ★
CHARTERED PATENT AGENTS

Date of mailing (day/month/year) 20 April 2000 (20.04.00)	
Applicant's or agent's file reference J41093WO	**IMPORTANT NOTICE**

International application No.	**International filing date** (day/month/year)	**Priority date** (day/month/year)
PCT/GB99/03445	15 October 1999 (15.10.99)	15 October 1998 (15.10.98)

Applicant
BRITISH AIRWAYS PLC et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
   AU,CN,JP,KP,KR,US

   In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:
   AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CU,CZ,DE,DK,EA,EE,EP,ES,FI,GB,GD,GE,GH,GM,
   HR,HU,ID,IL,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,
   RO,RU,SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZA,ZW
   The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on
   20 April 2000 (20.04.00) under No. WO 00/21831

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, **a demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer
J. Zahra

Telephone No. (41-22) 338.83.38